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USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

Enhanced Preliminary Assessment Report:

Fairfield Army Housing Units
Fairfield, Connecticut



October 1989

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prepared for

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<p>Argonne National Laboratory has conducted an enhanced preliminary assessment of the Army housing property located in Fairfield, CT. The objectives of this assessment include identifying and characterizing all environmentally significant operations, identifying areas of environmental contamination that may require immediate remedial actions, identifying other actions which may be necessary to resolve all identified environmental problems, and identifying other environmental concerns that may present impediments to the expeditious sale of this property.</p>			
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SUMMARY

The Fairfield housing area located in Fairfield, Conn., presents no imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. No immediate remedial actions, therefore, are warranted for the site.

Although these housing units were originally developed in support of a Nike missile battery, all available documentation and circumstantial evidence indicate that the housing property was wholly independent of the battery's operational activities. No Nike-related wastes were delivered to this property for management or disposal. Furthermore, since this property was independent of the Nike missile operations with respect to all necessary utilities, there is no possibility of migration of Nike-related wastes along buried utility lines. Nevertheless, three environmental impacts at this property have been identified, each of which warrants some remedial action prior to release of this property.

One concern derives from the information reported by both the Area Facility Engineer and the resident occupant, which indicated that unit #376 had asbestos releases from the insulation wrap around the water-heater pipe. This problem was addressed in the short term by applying protective tape around the deteriorating insulation. (CR) ←

Finally, it was found during the site visit that a common practice was to leave the spigots to the cement containment troughs around the above-ground tanks in the open position. This was to allow drainage of accumulated rainwater from the troughs. If a spill were to occur, this practice would compromise the effectiveness of the spill containment trough. These above-ground tanks had only a primer paint covering at the time of installation. This does not provide adequate protection against adverse weather conditions over an extended period of time.

The following actions are recommended prior to release of this property:

- Remediate problems resulting from deteriorating asbestos-containing water pipe insulation at unit #376.
- Coat the existing above-ground tanks with a protective paint to insure extended wear integrity of these tanks.
- Develop and implement a solution to the possibility of containment-box drainage taps being inadvertently left in the open position.

These recommendations assume that the property will most likely continue to be used for residential housing.

1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Fairfield housing area addressed in this preliminary assessment.¹

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in Fairfield, Conn.

1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program by assessing the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Status with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

1.3 PROCEDURES

The PA began with a review of Army Housing records located at Fort Devens, Mass., during the week of May 15-19, 1989. Additional information was obtained from the Family Housing Office, Fort Nathan Hale, located in New Haven, Conn., and from conversations with personnel from the Area Facility Maintenance Office in Windsor Locks, Conn., during the week of July 17-21. A site visit was conducted at Fairfield, Conn., on July 18, 1989, at which time additional information was obtained through personal observations of ANL investigators. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

Access to one of the housing units during the site visit was obtained through the senior occupant at the facility. In addition, ANL investigators revisited the property on September 7, 1989, at which time the interiors of all but eight of the units (units #320, 321, 336, 376, 385, and 409, Quincy St.; and units #58 and 100, Jarvis St.) were inspected.

2 PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION

The Fairfield housing area is located in southwestern Connecticut in the town of Fairfield, in Fairfield County. The property consists of 7.04 acres of land in fee.² Figures 1 and 2 show the general location of the housing area.

The housing units were developed in 1958,³ and no additional construction has taken place on the property since that time. The Army Corps of Engineers Office for the Connecticut area, located in Springfield, Mass., is responsible for major renovations or upgrading within the housing area.

2.2 DESCRIPTION OF FACILITY

Figure 3 presents the site plan of the housing property.

Housing Units

The Fairfield housing area consists of 28 "Capehart"-style houses, each having 3-bedrooms. (Capehart is the name assigned to this model home by the builder, National Homes.) Fourteen of these units have carports; the other 14 do not. All of the units are built on a concrete foundation, with a concrete floor covered with vinyl-asbestos tiles, wood-frame walls with cedar shakes, and a wood roof with asphalt shingle. Each unit has an in-ground, 15-gallon capacity, garbage container (no longer in use), a 28-80 ft clothesline, and concrete patio in the backyard.^{3,4}

Utilities

Each house has an individual forced warm-air furnace with oil burner. The heater ducts were moved to the ceiling area when the heating systems were renovated in 1988. The original heating ducts embedded in the foundation slab were abandoned in place. The housing area has been on city water since original construction, with 28 feeder lines from the city's main water line to the individual houses. Two transformers on the property are owned by the Fairfield power company and supply electricity to the housing area.⁴ There is no documentation on the possible presence of PCBs in these transformers. However, no evidence of spills or leaks was found.

Sewage

Since initial construction, the housing units have been connected to the municipal sanitary sewer. Six inspection manholes are located on site.⁴ No problems with the sanitary sewer have been documented.

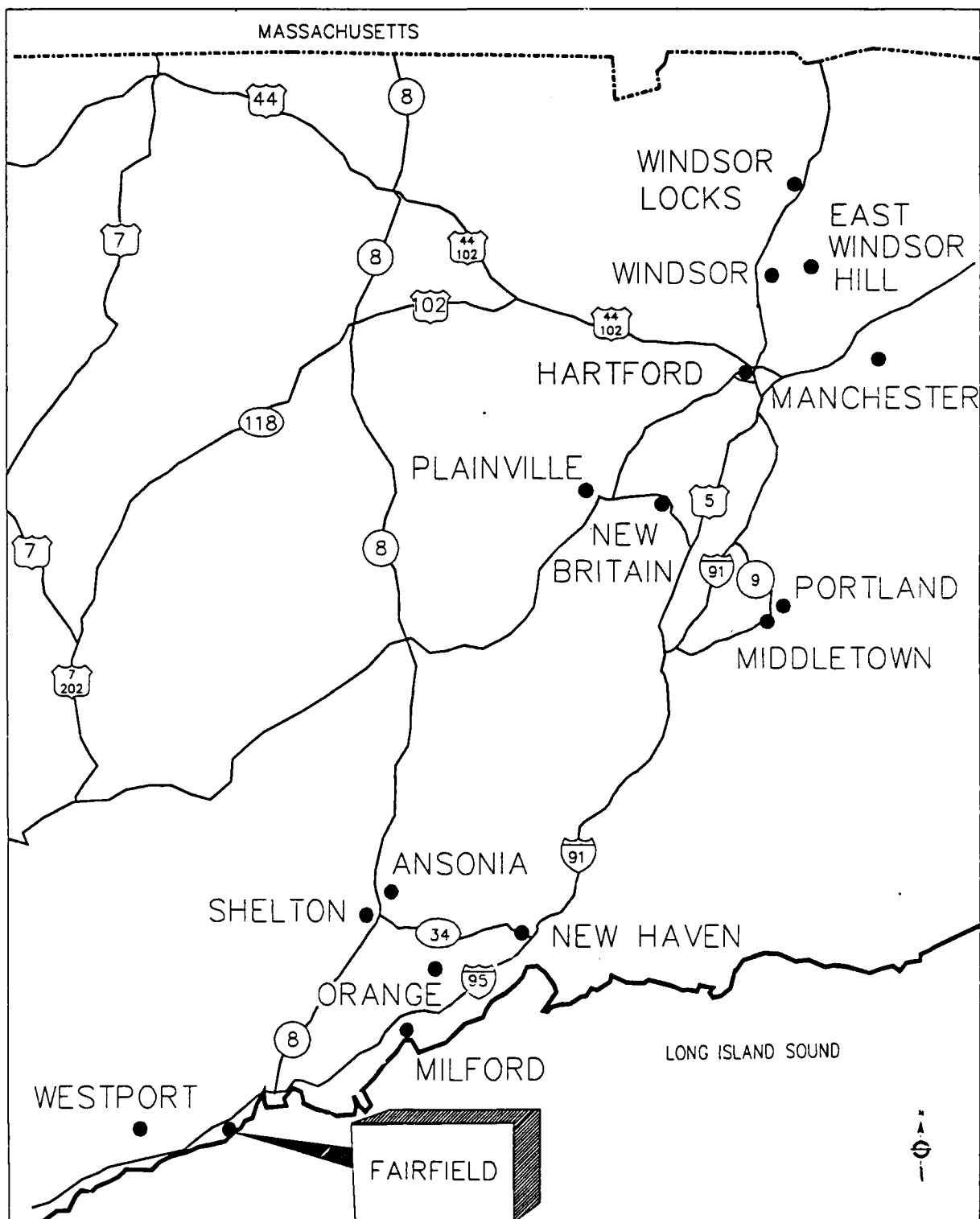


FIGURE 1 Location Map of Connecticut Army Housing Facilities

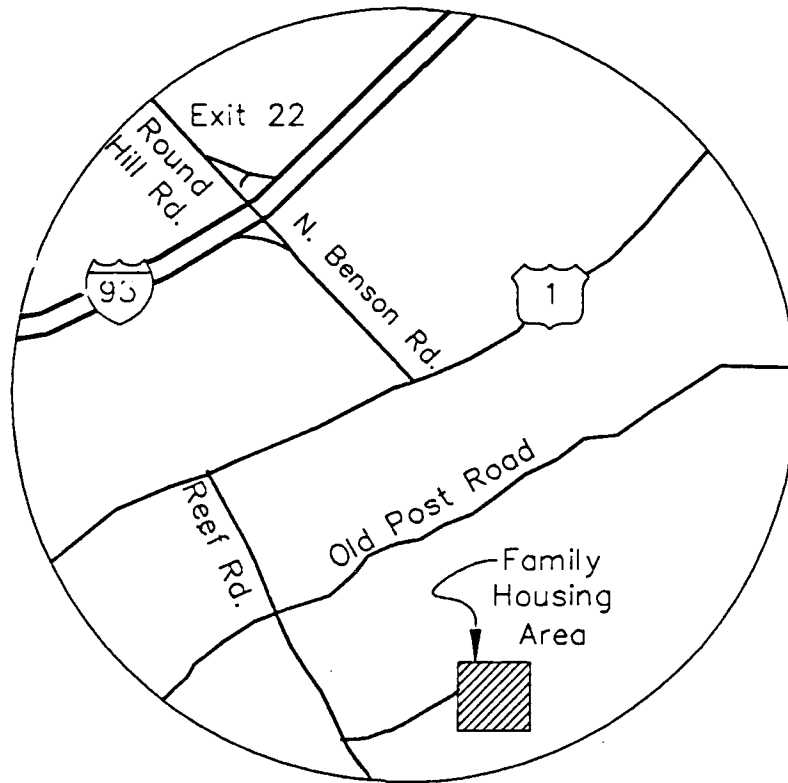


FIGURE 2 Vicinity Map of Fairfield Army Housing Units

Fuel Storage

Each unit was originally constructed with a 275-gallon underground fuel-oil storage tank at the rear of the house. Approximately two years ago, the New York District Army Corps of Engineers replaced the underground tanks with new 275 gallon above-ground tanks. The underground tanks were filled with sand and left buried behind each unit. No samples were taken of soils surrounding these tanks. No releases from these tanks are documented or suspected. Rather, these tanks were replaced as a result of good engineering practice, dictated by the advancing ages of the tanks.

Storm Drainage Systems

The property is drained by open ditches or surface runoff.

Other Permanent Structures or Property Improvements

No major additions or permanent structures have been added since original construction.

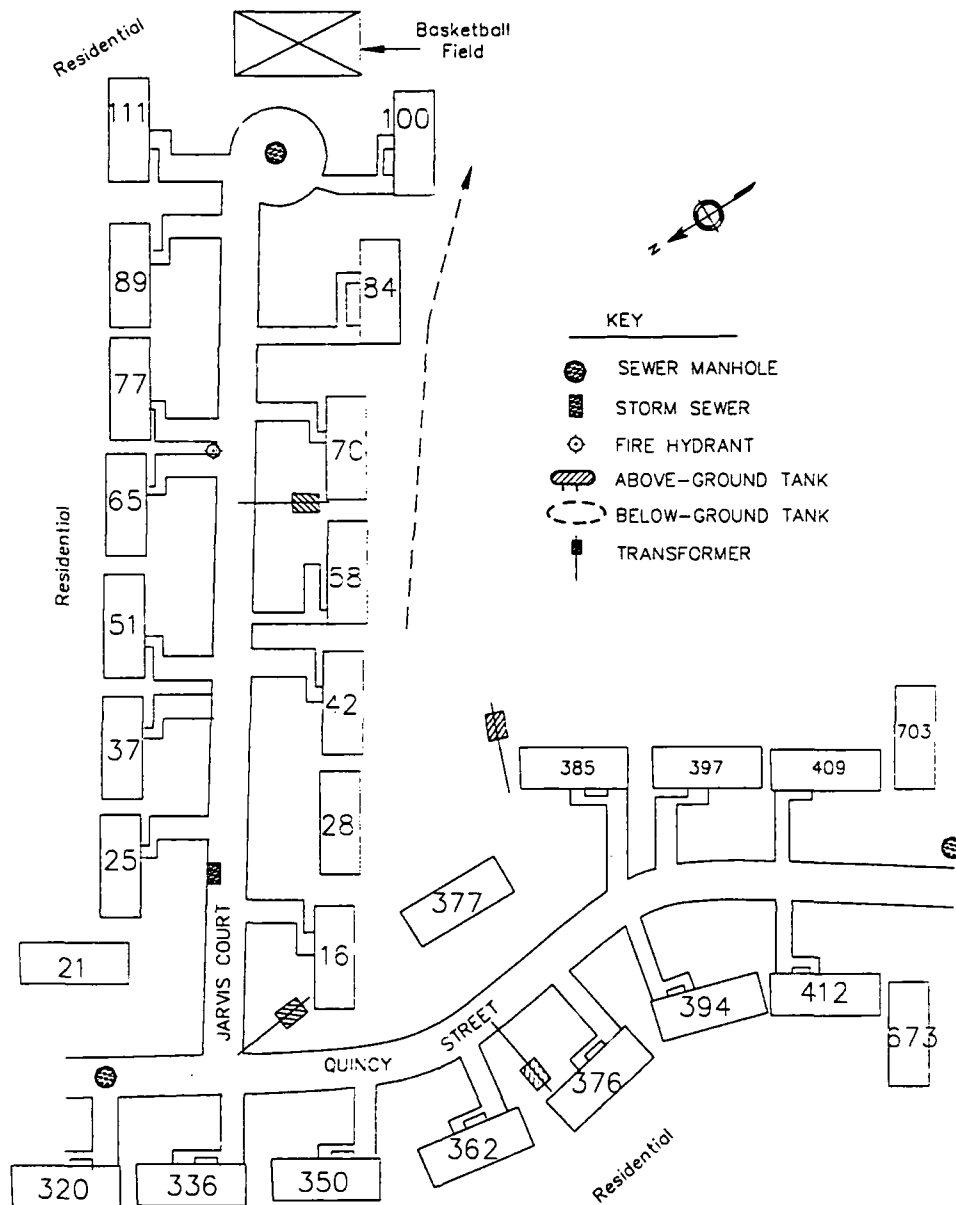


FIGURE 3 Site Plan Map of Fairfield Army Housing Units

2.3 PROPERTY HISTORY

2.3.1 Nike Defense Program and Typical Battery-Level Practices

Generic information on the national Nike anti-aircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers⁵ and the other by the U.S. Army Toxic and Hazardous Materials Agency.⁶ In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and specifications (for the facilities and the missiles themselves), interviews with Army

personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by 1976, with many of the properties sold to private concerns or excessed to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon tetrachloride, chromium and lead (contained in paints and protective coatings),

petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

2.3.2 Fairfield Housing Area

The Fairfield housing area was constructed in 1958 as a stand-alone housing facility for military personnel assigned to the Fairfield Nike battery. Although developed along with the Nike battery defense program, the housing area has always remained independent from the Nike operations and utilities of the Nike battery. Twenty-eight single-family houses were erected on the property at original development, and no other structures have been built since that time. The area continued to be used as housing for military personnel after decommissioning of the Nike battery in the early 1970s.

Improvements and renovations for this site include installation of smoke/heat detectors in 1979, as well as entire bathroom and window replacements in 1988. New siding and blacktop roads were added in 1989.

2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE

Fairfield is located along Long Island Sound in a relatively flat area. The housing area is surrounded by private residential houses and private small businesses. An open field comprising a baseball field and tennis courts borders the east side of the property. The town of Fairfield has an estimated population of 52,000.⁷

2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

Fairfield is located in the Saugatuck River Basin of the New England Upland section of the New England Physiographic Province. The Saugatuck River Basin is located in southwestern Conn. This 26-mile-long river flows from Ridgefield to Westport

and has a drainage area of 93.2 square miles (mi^2). Water-supply reservoirs that receive drainage from 51.4 mi^2 are used by a private company to supply 320,000 people in 8 towns -- almost 50% of the population of southwestern Conn. A long-term declining trend in average annual daily discharge caused by interbasin water demands is observed; presently 60% of stream flow is used for water supply. Water shortages are frequent in southwestern Connecticut because of distribution problems and the relatively small size of its reservoirs, except in the Saugatuck River Basin. Other companies, however, purchase water from the same water supplier during drought periods and impose additional demands on their supply by way of an interconnected pipe system. There is no flood control in this basin and floods could still occur, such as the one on October 16, 1955, where the peak was 14,800 cubic feet per second or 9,570 million gallons per day.

Stratified drift is the only aquifer capable of large sustained yields of water to individual wells. Till is widespread and generally provides only small amounts of water. Wells in till normally yield only a few hundred gallons of water daily and commonly are inadequate during dry periods. Till is generally used only as an emergency or secondary source of water.

Bedrock aquifers underlie the entire Saugatuck River Basin and include sedimentary, igneous, and metamorphic rock types. These aquifers supply small but reliable quantities of water to wells throughout the basin and are the chief source for many nonurban homes and farms. About 90% of the wells tapping bedrock yield at least 2 gallons per minute, and much larger yields are occasionally reported.

The quality of water upstream from the Saugatuck Reservoir is excellent and is presently used for public supply. The water quality of the Saugatuck River downstream from Saugatuck Reservoir is considered by the Connecticut DEP to be suitable for drinking water.⁸ The water is generally low in dissolved solids and is soft to moderately hard. Surface water is less mineralized than groundwater, especially during high flow when it is primarily surface runoff. Iron and manganese occur in objectionable concentrations in parts of the area, particularly in water from streams draining swamps and in water from aquifers rich in iron- and manganese-bearing minerals.

Incidences of groundwater contamination detected by state and local agencies increased significantly over the last decade largely because of more comprehensive monitoring and analyses. Practices such as burial of fuel storage tanks and improper waste disposal, the prospect of continued urban growth, the potential for accidental spills of chemicals, the likely strengthening of state drinking-water standards, and the hydrogeologic characteristics of major aquifers suggest that groundwater contamination will continue to be a problem in Conn. Furthermore, groundwater and surface water are so interrelated in Conn. that their quality cannot be managed separately. Yields of large public-supply and industrial wells commonly depend on induced recharge from surface-water bodies. Conversely, groundwater under natural conditions discharges mainly to streams, lakes, and estuaries. State water-quality management efforts are focused on conjunctive management of groundwater and surface water within the framework of major river basins.⁹

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

3.1 UNDERGROUND STORAGE TANKS

Currently, all the original underground fuel-oil storage tanks remain buried at the rear of each house and are filled with sand and/or fine-size gravel. Each house is supplied with fuel-oil from the above-ground tanks installed in 1986 at the rear of the houses. No soil tests were performed around the underground tanks, and no documentation indicates that the tanks had cathodic protection or other protective coverings at installation. However, there is no evidence of releases of petroleum contamination from any of the underground tanks.

3.2 ASBESTOS WRAP

Reportedly, unit #376 at the Fairfield site had asbestos releases from deteriorated water-heater pipe insulation in the utility room. The situation was addressed by the Area Facilities Engineer by wrapping protective tape around the deteriorating insulation. Although this remedy prevents any immediate health hazard, it does not represent a long-term solution to the problem.

3.3 ABOVE-GROUND TANKS

The above-ground tanks have only a primer paint to cover them and a make-shift shelter attached to the house a few feet above the tanks. This does not offer adequate protection to the tanks against adverse weather conditions. Areas of rust and corrosion were observed on some of the tanks.

It is common practice for the residents of the housing area to leave the spigots open which drain the cement troughs around the above-ground tanks. This is to allow the rainwater which collects in these tanks to drain away. Residents store garbage cans, lawn chairs, and miscellaneous supplies in this trough area. If these spigots are left open routinely, the effectiveness of the cement troughs as spill-containment devices would be compromised. No such incident has occurred, however.

4 KNOWN AND SUSPECTED RELEASES

There have been no known major releases or impacts to the environment from the Fairfield housing area. No hazardous wastes or hazardous materials are stored on-site.

There have been no documented releases to the soil from this property from the underground tanks originally in use on the property. These tanks were decommissioned approximately two years ago and filled with sand, but no integrity or leak tests have ever been made.

Possible asbestos releases may have occurred from the insulation wrap around the water-heater pipes in unit #376. The Area Facility Engineer indicated samples were taken of the insulation in unit #376, but no documentation was available to confirm this.

5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although these housing units were originally developed in support of a Nike missile battery located in Fairfield, Conn., no wastes associated with the operation or maintenance of the battery were delivered to or managed at this property. Furthermore, the housing area was completely independent of the battery's launch and fire control operations with respect to water, sewer, and electrical utilities. No documentation was found during the site visit to suggest the existence of utility connections between the housing area and the other battery properties.

The Area Facilities Engineer stated that asbestos was suspected in the insulation around the water-heater pipes in unit #376, but no sample results confirming the presence of asbestos were found. Water-pipe insulation was found to have deteriorated at unit #376. Deteriorated pipes at this house were wrapped in tape to prevent airborne asbestos. Vinyl-asbestos floor tiles were used in the original construction of the houses, but these tiles were found to be in good condition.

Original underground fuel storage tanks have been abandoned in place and replaced with above-ground tanks. There is no documentation of releases of petroleum products from the original underground tanks.

Although the above-ground tanks were installed with a cement containment trough around them, the effectiveness of containing a possible oil-spill is compromised with the common practice of leaving the spigots to the troughs left in the open position. These tanks were installed with only a primer paint coating, which does not allow adequate protection from adverse weather conditions over an extended period of time. Some corrosion was observed.

6 RECOMMENDATIONS

The Fairfield housing area presents no imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. No immediate remedial actions, therefore, are warranted for the site. Nevertheless, three potential environmental impacts from this property have been identified and these ultimately could warrant remedial action.

The above-ground tanks do not have cathodic coating or any other protective covering. It is recommended that these tanks be painted with a coating which will offer adequate protection against adverse weather conditions. A cement trough surrounds the individual above-ground tanks behind each house. At the time of the site visit, it was found to be a common practice to leave the spigots open to allow for drainage of accumulated rainwater inside these troughs. The effectiveness of spill containment is compromised if the spigot of the trough is left in the open position.

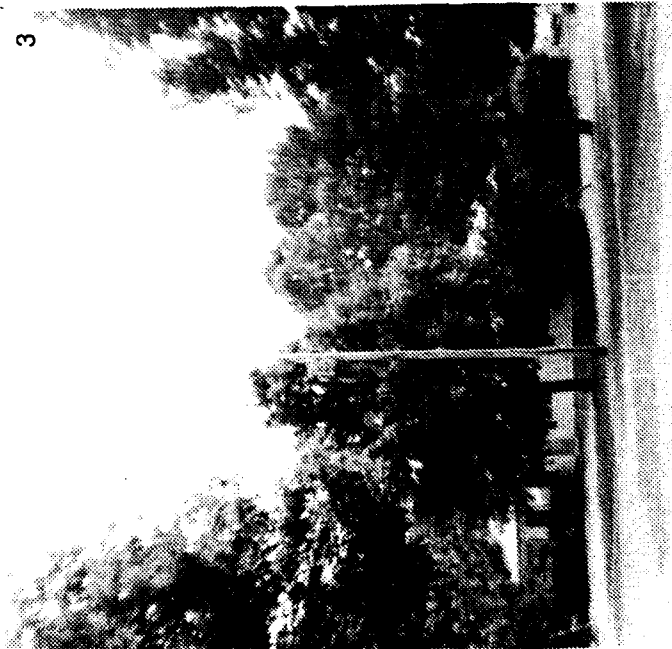
A second potential concern derives from the deteriorated condition of water-pipe insulation in unit #376, which is reported to contain asbestos. The deteriorated insulation should be replaced.

These recommendations assume that this property will most likely continue to be used for residential housing.

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APPENDIX:
PHOTOGRAPHS OF FAIRFIELD HOUSING FACILITY
AND SURROUNDING LAND



IDENTIFICATIONS OF PHOTOGRAPHS

1. Entrance to the housing facility.
2. Capehart-style home.
3. Electrical transformer mounted near the top of a utility pole; transformers are the responsibility of the Fairfield Power Company, with the utility pole erected on government-easement land.